Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
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NextNav Petition for Rulemaking, Enabling Next-Generation Terrestrial Positioning, Navigation, and Timing and 5G: A Plan for the Lower 900 MHz Band (902-928 MHz)	)))))	WT Docket No. 24-240 RM-11989

COMMENTS OF HID GLOBAL CORPORATION ON THE NEXTNAV PETITION FOR RULEMAKING

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HID[1] is a global leader in trusted identity solutions for a connected world. Everyday millions of people in more than 100 countries use our products and services to securely access physical and digital places. Over 2 billion things that need to be identified, verified and tracked are connected through HID's technology. We are grateful for the opportunity to submit these comments in response to the request from the Wireless Telecommunications Bureau ("WTB") and the Office of Engineering and Technology ("OET")[2] on the NextNav Petition for Rulemaking.[3]

Noting that the NextNav Petition seeks "removal of the current requirement that it not cause unacceptable levels of interference to part 15 devices"[4], the WTB and OET specifically "seek comment on the extent of part 15 devices and amateur devices in the band and what potential impact band reconfiguration and flexible use, including elimination of the testing requirements of current rule section 90.353(d), might have on part 15 devices an on the amateur community."[5] As a major supplier of part 15 devices to government, industrial and commercial customers in the U.S., HID is gravely concerned about the potentially widespread and serious impact on America's national security and economic prosperity if the NextNav Petition is granted.

As general background, passive UHF RFID systems involve two main components: tags and readers. The tags can be, and in practice are, applied to almost any article to be tracked or otherwise monitored. Each UHF RFID tag includes an antenna and an integrated circuit that is energized by UHF transmissions from a reader, allowing the tag to communicate data back to the reader. On relatively simple tags, the communicated data may simply be a unique identifier, while more sophisticated tags can do significantly more, including executing encryption routines and sensing and reporting variable properties of the connected article (e.g., temperature, vibration). As tags add additional features, the benefit to the US of a smarter supply chain will expand exponentially.

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[1] See https://www.hidglobal.com for more information on HID.
[2] Wireless Telecommunications Bureau and Office of Engineering and Technology Seek Comment on NextNav Petition for Rule Making, WT Docket No. 24-240, Released August 2, 2024 ("DA 24-776")
[3] NextNav Petition for Rulemaking, Enabling Next -Generation Terrestrial Positioning, Navigation and Timing and 5G: A Plan for the Lower 900 MHz Band (902-928 MHz) at I (filed Apr. 16, 2024, with supplement filed June 7, 2024, collectively "NextNav Petition").
[4] DA 24-776, p. 4.
[5] *Id.*

The tag structure can also vary widely, depending on the factors like properties of the attached article (e.g., metal or non-metal, attachment surface geometry) and anticipated environmental conditions (e.g., extreme temperature, pressure, humidity, chemical exposure). Tag structure can add additional functionality, such as visual and electronic tamper detection features. Passive UHF RFID tags sold for use in the U.S. are designed to maximize read range when interrogated in the 902 to 928 MHz band. While U.S.-optimized tags can be potentially be read outside this band, performance will be degraded.

UHF RFID readers are powered electronic equipment, ranging from portable, handheld devices to tabletop or wall-mounted panels to large, installed gateways and cabinets. Readers incorporate antennas and associated circuitry to transmit and receive UHF signals to and from the tags in order to read, and in some cases write, the data stored thereon. Because part 15 devices must accept interference from other users, UHF RFID readers used in the U.S. operate across the entire 902 to 928 MHz band, employing frequency hopping or direct sequence spread spectrum to increase interference resistance.

Beyond the elimination of the testing requirements of the current section 90.353(d), granting the NextNav petition would allow NextNav to force shutdown of other systems interfering with its own. As NextNav receivers would not be required to be resilient to the types of interference they are essentially guaranteed to encounter from interference resistant devices like UHF RFID readers (e.g., receiver blocking, receiver desensitization and cross modulation), operation of these readers would always be in danger of being stopped by NextNav.

Part 15 Device Use Examples

The WTB and OET specifically ask, "What services are being provided by part 15 devices and amateur operations in this band?"[6] While anything approaching an exhaustive list would be impossible within the scope of these comments, the following are a few specific examples drawn for HID's own U.S. business experience:

U.S. Law Enforcement

The Federal Bureau of Investigation ("FBI") uses a passive UHF RFID system to track DNA samples at the FBI Laboratory in Quantico, Virginia.

U.S. Military

The U. S. Marine Corps use a passive UHF RFID system for tracking equipment during refurbishment and deployment at Marine Corps Support Facility Blount Island.

National Transportation and Logistics

Passive UHF RFID systems are used in distribution centers throughout the U.S. to track trucks and trailers, improving vehicle management to reduce latency times and fuel consumption in the supply chain.

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[6] *Id.*

National Information Technology Infrastructure

Passive UHF RFID systems are used in data centers across the country, with UHF RFID tags being integrated into IT equipment to vastly increase the efficiency of inventory and lifecycle management.

Healthcare

Hospitals throughout the U.S. use passive UHF RFID systems to track surgical kits and surgical instruments. Surgical kit inventory monitoring ensures the safety and availability of vital surgical supplies, while surgical instruments are tracked through cleaning and sterilization to improve patient outcomes.

Commercial Laundry Management

The use of passive UHF RFID systems with millions of individually tagged linens, towels, uniforms and other clothing items allows for unprecedented inventory control, laundry monitoring, and employee accountability in multiple industries (e.g., hotels, resorts, theme parks, casinos, hospitals, nursing homes) to achieve cost reductions from labor savings, reduced inventory loss and more accurate purchase forecasting.

Media Production

Hundreds of thousands of lights, cables and other production assets used in movie, television and other media products are tracked with passive UHF RFID systems. HID has supplied tags to diverse media organizations like MGM, Sony Pictures and Manhattan Beach Studios.

Retail

Retail is easily the largest user of passive UHF RFID, including approximately half of the tagged items in the U.S. - and growing steadily. The use of passive UHF RFID systems in retail applications maximizes profitability and minimizes costs in multiple manners. Among many examples, passive UHF RFID systems allow for significant reduction in food waste (currently estimated to be approximately $161 billion in wasted food annually), as well as enabling compliance with the Food Safety and Modernization Act.[7]

Practical and Economic Impact of Rulemaking

In connection with consideration of possible accommodation of part 15 devices in other spectrum bands, the WTB and OET ask, "What are the costs for relocation and how long would it take?"[8] According to the best estimate available to HID, there are approximately *80 billion* items tagged with passive UHF RFID tags in the U.S. alone. As evidenced by the above examples, some of these tags are applied to durable goods in critical government, industrial and commercial applications. Even if these tags remained useable, performance could be appreciably degraded.

While simple, label-type UHF RFID tags can cost less than one dollar, costs for more specialized tags, such as on-metal or extreme condition tags, can extend into the tens or hundreds of dollars. Given the extremely high quantity of tagged items, the cost of replacement could still be very significant, as well as the potential cost to tag manufacturers to design tags optimized for the new band. Both of these cost components, however, would likely pale in comparison to the time and labor costs of physically retagging items. It should also be noted that some tags cannot be removed without damage to the associated item.

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[7] FDA Food Safety Modernization Act, PL 111-353 (January 4, 2011).

[8] DA 24-776, p. 4.

As discussed above, existing UHF RFID readers will impermissibly interfere with NextNav devices operated according to the parameters of the NextNav Petition. More than two hundred thousand UHF RFID readers were deployed in the U.S. in 2023 alone. Replacement of the hundreds of thousands of reader devices operated in the U.S. today in support of passive UHF RFID systems would place a significant financial burden on system operators. Even handheld commercial- and industrial-grade RFID readers typically cost over a thousand dollars each. Large installed systems cost many times that amount. Allowing NextNav to stop the operation of interfering RFID readers under the terms of the NextNav Petition could easily require billions of dollars in costs for replacement readers, with years required to replace that inventory.

International Considerations

Notably, restricting band usage for passive UHF RFID systems runs contrary to the international trend. Recognizing that UHF RFID systems are a key technology for the future economy, the European Union is actually *increasing* the available spectrum for these systems to close the performance gap between E.U. systems and the currently higher performing U.S. systems operating in the 902 to 928 MHz band.[9] By granting the NextNav Petition, the U.S. would be sacrificing its operational performance advantage in this band right at the moment other countries move to take advantage of it.

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[9] *European Countries Approve Upper Band for RFID*, RFID Journal, Claire Swedberg (August 12, 2024), retrieved from https://www.rfidjournal.com/news/european-countries-approve-upper-band-for-rfid/221462/. A key point noted by the author: “The upper band 915 to 921 MHz adoption by most European countries will make UHF RFID higher performance as well as more universally operable, since the channels overlap with those used in North America and beyond.”

Conclusion

Passive UHF RFID is a crucial technology that enhances the resilience and efficiency of America's supply chains, businesses, and government agencies. As described in the Executive Order on Resilient Supply Chains of June 2024[10], the United States needs resilient, diverse, and secure supply chains to ensure our economic prosperity, public health, and national security. Resilient supply chains include greater domestic production; a diverse and agile supplier base; a reliable transportation system; secure critical infrastructure; adequate stockpiles; reliable food systems; and a world-class, globally competitive American manufacturing base.

Granting the NextNav Petition will impair the advantages gained via the use of passive UHF RFID systems, while rendering hundreds of thousands of thousands of readers obsolete and, at best, degrading the performance of millions or even billions of tags in the process. Recouping these losses will, to the extent possible, require billions of dollars of investment in labor and new material over several years. Accordingly, HID respectfully submits that the NextNav Petition should be denied.

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[10] https://www.whitehouse.gov/briefing-room/statements-releases/2024/06/14/executive-order-on-white-house-council-on-supply-chain-resilience/

Respectfully submitted,

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